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Abstract

Intentional self-regulation (ISR) is thought to undergo significant development during the second decade of life, but our understanding of ISR's development during this period remains incomplete. We discuss the development of ISR as operationalized by Freund and Baltes' (2002) measure of Selection, Optimization, and Compensation (SOC). We used data from 5,471 youth that had participated in the 4-H Study of Positive Youth Development in Grades 5 through 12. Using exploratory factor analyses, our findings suggest that the SOC Questionnaire adheres to a stable three-factor structure across adolescence, with factors representing Selection, Intentional Self-Regulation, and a Reverse-Coded Method Factor. We discuss the implications of our findings for future research.

*Keywords: self-regulation, adolescence, factor analysis, selection optimization and compensation*

# Self-Regulation Across Adolescence:
# Exploring the structure of selection, optimization, and compensation

In order to maximize developmental gains in complex physical, social, cultural, and historical contexts, individuals must intentionally regulate their actions in ways that meet their personal goals and environmental demands (Brandtstädter, 2006; Lewontin, 2000). As such, self-regulation has been associated with adaptive developmental outcomes across the life span (Geldhof, Little, & Colombo, 2010). Researchers have hypothesized that intentional self-regulation (ISR) undergoes significant development during the second decade of life (Freund & Baltes, 2002; Gestsdottir & Lerner, 2008; Napolitano, Bowers, Gestsdottir, & Chase, 2011), yet our understanding of ISR development during this period remains incomplete.

In this paper we discuss the development of ISR, as operationalized by the Freund and Baltes (2002) measure of Selection, Optimization, and Compensation (SOC). Due to the lack of clarity in the literature on how the processes of goal selection, optimization, and compensation differentiate across adolescence, we present results from exploratory factor analyses of the SOC questionnaire by drawing on data from fifth through twelfth Grade youth who participated in the 4-H Study of Positive Youth Development (Bowers et al., 2010; Lerner et al., 2005; 2009; 2010; Phelps et al., 2009). We explore how the primary components of SOC differentiate across adolescence as anticipated by previous research (Lerner et al., 2001).

## The Importance of SOC Skills during Adolescence

Recent research suggests that the capacity for intentional self-regulation grows and becomes increasingly important for adaptive functioning during adolescence (Gestsdottir & Lerner, 2008). Biological development during adolescence, including changes in the prefrontal cortex, increases in interconnectivity among brain regions, and increases in dopamine levels,

provides the opportunity for increased cognitive control, especially in relation to long-term goals (Steinberg, 2010). In addition, a sense of personal future becomes increasingly important during adolescence (Havighurst, 1972; Schmid & Lopez, 2011). A more developed identity helps the young person form goals about his or her personal future, which contribute to the use of goal-relevant strategies such as SOC (Brandtstädter, 2006; Schmid et al., 2011). For instance, if a young person sees achieving a college education as an important life goal, he or she is more likely to construct a goal hierarchy to reach this overarching goal, to seek means to achieve that goal, and to persevere if achieving that goal becomes difficult. Together, the biological, psychological, and social changes of adolescence contribute to increased abilities for long-term, adult-like decision-making, goal selection, and goal pursuit skills (Brandtstädter, 1989; Keating, 2004; McClelland, Ponitz, Messersmith, & Tominey, 2010).

As capacities for internal, intentional forms of self-regulation grow, youth typically face increased expectations for setting and achieving their own goals. At the same time, parents frequently become less involved in supervising their children's lives as they enter adolescence and teachers expect students to work more independently than before (Lerner & Steinberg, 2004). Therefore, intentional self-regulation becomes increasingly important for healthy functioning during adolescence, as a young person's abilities to intentionally impact his or her environment through the regulation of emotions, attention, thinking, and behaviors grows. Such development helps individuals successfully meet the challenging developmental tasks of adolescence (Gestsdottir & Lerner, 2008).

**The SOC Model**

We define self-regulation as the subset of bidirectional relations between individuals and their contexts through which an individual alters his or her own environment in the service of

attaining an adaptive goal. While self-regulation involves both intentional and non-conscious, organismic processes, we note that the intentional, adaptive application of Selection, Optimization, and Compensation strategies correspond to what has been described in the literature as intentional self-regulation (ISR; Gestsdottir & Lerner, 2008). ISR, therefore, represents an individual's ability to actively regulate interactions with his or her environment to achieve personal goals. Given such a broad definition, it should come as no surprise that researchers have operationalized ISR in many, often oblique, ways (Brandtstädter & Lerner, 1999; Lerner, Lerner, Bowers, Lewin-Bizan, & Urban, 2011). In this paper we focus on one model that has been especially influential among developmental scientists: Baltes and colleagues' Selection, Optimization, and Compensation model (SOC; Baltes & Baltes, 1990; Freund & Baltes, 2000). The SOC model has proven useful for understanding self-regulated action across much of the life span (early adolescence through the tenth decade of life; Baltes, Lindenberger, & Staudinger, 2006), emphasizing four self-regulatory action processes: Elective Selection, Optimization, Compensation, and Loss-Based Selection.

Elective Selection (henceforth S*election*) refers to an individual's ability to commit to a set of meaningful goals drawn from the nearly infinite range of all possible goals. Selection also entails the organization of goals into a meaningful hierarchy and the contextualization of goals in response to personal and environmental needs (Freund & Baltes, 2000, 2002). Individuals commit to goals through selection, but selection alone does not guarantee successful goal attainment. Instead, the SOC model specifies *Optimization* as including self-regulated actions that move an individual closer to attaining his or her selected goals. Optimization includes the acquisition and development of resources and skills, as well as cognitive abilities such as attentional focus and inhibitory control (see also Freund & Baltes, 2000, 2002).

Optimization applies to an individual's initial attempt to reach a goal, with the SOC model differentiating subsequent responses to failure or loss as instances of *Compensation*. Compensation requires that individuals adaptively navigate setbacks by implementing alternative means to reach a goal, such as acquiring new skills or seeking the help of others (Freund & Baltes, 2000, 2002). The final component specified by the SOC model, *Loss-Based Selection* (LBS), lies at the intersection of Selection and Compensation. Like Compensation, Loss-Based Selection represents an individual's response to obstacles that arises during goal pursuit. Baltes and colleagues define Loss-Based Selection as a form of selection, but differentiate LBS from Elective Selection by specifying LBS as pertaining to events in which an individual responds to an obstacle by re-organizing his or her goal hierarchy (Freund & Baltes, 2000, 2002). Loss-Based Selection might entail selecting new goals, reconsidering the importance of previously-selected goals, or replacing one goal by dedicating additional energy toward another goal (i.e., an act of de-selection; see also Freund & Baltes, 2000, 2002).

The relation between gains and losses is characteristic of development across the life span (e.g., synaptic pruning enhances visual acuity in infants, and growth in native-language proficiency in childhood and early adolescence decreases the probability of native-level fluency in other languages; Baltes et al., 2006). However, whereas adolescents may experience fewer losses than adults, it remains unclear whether adolescents interpret Loss-Based Selection in the same way as adults. For instance, because adolescence is a period of more growth than decline (Baltes et al., 2006), adolescents and young adults may interpret the "loss" component of Loss-Based Selection as indicating failure rather than developmental declines (as intended by Baltes and colleagues, see Geldhof, Little, & Hawley, 2012 for a brief discussion). For this reason, the 4-H study did not include the LBS scale during the first waves of data collection. Alternatively,

although LBS captures how people manage age-related decline in older populations, it may also be applicable to adolescence. Consistent with our previous discussion, we can characterize adolescence as a time of increased demands for independent functioning and, consequently, self-regulatory strategies (or other functioning) that may have been appropriate before may not be sufficient to manage the challenges of adolescence. In this way, LBS may be particularly relevant to adolescent functioning. When added, empirical evidence indeed suggests that LBS may be an important aspect of adaptive adolescent self-regulation (see Gestsdottir, Bowers, von Eye, Napolitano, & Lerner, 2010). Therefore, we include Loss-Based Selection in our analyses when available.

**The Development of SOC Across Adolescence**

During the last few years, research derived from the 4-H Study of Positive Youth Development (Lerner et al., 2005) has attempted to ascertain the development of adolescent ISR processes as indexed by SOC. Consistent with the prediction of Freund and Baltes (2002), there are indications that the SOC processes move from a single, undifferentiated factor to a more differentiated, tripartite structure of Selection, Optimization, and Compensation during adolescence. Conclusive evidence in support of differentiation does not yet exist, however.

Prior research using the 4-H study data set suggests that, in early adolescence (Grades 5 through 7), a single-factor model that included only a subset of nine items (out of 18) from the SOC questionnaire fit the data significantly better than a differentiated, tripartite model that examined separate Selection, Optimization, and Compensation constructs (Gestsdottir & Lerner, 2007; Zimmerman, Phelps, & Lerner, 2007). Subsequent work (Gestsdottir et al., 2009) identified a tripartite model during Grades 8, 9, and 10 – middle adolescence – although a single factor solution similar to the one identified in early adolescence also displayed acceptable fit.

Even though correlations between the SOC factors decreased with age, suggesting differentiation, the Optimization and Compensation components remained highly correlated.

While research has not confirmed the SOC processes as distinct constructs during adolescence, SOC strategies have been consistently related to positive developmental outcomes. These findings also provide mixed evidence in support of differentiation of SOC during adolescence. SOC scores predict positive and negative developmental outcomes in expected directions among both boys and girls. In addition, findings suggest that SOC more strongly relates to indicators of positive development than to indicators of risk and depression (see Bowers et al., 2011; Gestsdottir & Lerner, 2007; Gestsdottir et al., 2009), and that the strength of these relations increases with age. However, separate Selection, Optimization, and Compensation constructs have shown differential relations to various outcome measures. Gestsdottir et al. (2009, 2010) found that Optimization and Compensation (and, to a lesser extent, LBS) more consistently predicted healthy development than Selection. In addition, being in a trajectory of high levels of Selection across Grades 9 through 11 (and high levels of supportive parenting) was the most common pathway to PYD at Grade 11 (Napolitano et al., 2011). Such evidence suggests that the SOC constructs differentiate during middle adolescence.

Conclusive evidence for differentiation is still needed, however, as alternative evidence suggests a lack of differentiation across adolescence (Gestsdottir et al., 2009). SOC scores have been more strongly related to outcome measures when researchers model SOC as a single construct than when modeled as separate Selection, Optimization, and Compensation constructs. These results support the use of a single factor (see Gestsdottir & Lerner, 2007). In addition, confirmatory factor analyses suggest little or no difference between tripartite and unidimensional models of SOC, with the existing literature “unable to provide [conclusive] evidence against or

in support of… differentiation," (Gestsdottir et al., 2009, p. 591). These findings are distinct from those involving adult samples, where clearly differentiable Selection, Optimization, and Compensation constructs consistently predict positive developmental outcomes (Freund & Baltes, 2002). Therefore, the present research attempts to elucidate the differentiation processes of SOC across adolescence in order to clarify the links between ISR and both healthy and problematic development and move toward a more complete understanding of adolescent self-regulation.

**The Current Study**

Previous research using data from the 4-H Study has provided a complex picture of the development of SOC processes in adolescence. It seems clear that the tripartite structure of SOC that is characteristic of adulthood cannot be directly applied to adolescence. Findings regarding an adolescent-specific factor structure, which have mostly been based on confirmatory factor analyses, have been complicated. There is evidence for differentiation, both in terms of structure and functioning, especially between ES and the other scales, which increases with age. At the same time, the original subscales do not function well separately in adolescence, as reflected in findings of factor analyses strategies, low alphas, and lower correlations to outcomes as compared to a single SOC factor. .

In the present research we inductively examined the factor structure of SOC across eight years of adolescence by using exploratory factor analyses (EFAs). Specifically, we fitted separate EFAs to the SOC questionnaire in each wave of the 4-H Study (eight separate analyses fitted to 5$^{th}$ through 12$^{th}$ Grade data, respectively). These exploratory analyses allowed us to inductively explore the structure of SOC with greater precision than in previous work using these data, and therefore allowed us to examine how different aspects of SOC might emerge at

different ages. Unlike previous studies, we can now add data from the two last grades of the 4-H Study to our analyses, i.e., from Grades 11 and 12. As such, we aimed to provide a more nuanced understanding of the development of intentional self-regulation than previous research using the 4-H data has been able to provide, thereby providing a clearer direction for future research of how to best conceptualize and measure SOC processes among adolescent samples.

## Method

The present research used data from all eight waves of the 4-H Study of Positive Youth Development, a longitudinal study of adolescents in the United States that began in 2002 with the study of fifth graders and continued through 2011 with the collection of data from 12$^{th}$ graders (Lerner, Lerner, Lewin-Bizan et al., 2011). In all, the 4-H study contains data from more than 7,000 individual participants from 42 states in the United States. Below we present features of the methodology that specifically pertain to the goals of the current research; for a fuller description of the 4-H study we direct the reader to work previously published by Lerner and colleagues (Lerner, et al., 2005, 2009, 2010).

### Participants

The present research uses data from a subsample of the participants who provided SOC data in at least one wave of the 4-H Study ($n$= 5,471). Despite the longitudinal nature of the 4-H Study, the demographic characteristics of the sample vary from wave to wave. We present these variations in Table 1.

### Attrition

Attrition in the 4-H Study sample is not randomly distributed across schools or youth program sites. For example, in Grade 6 and Grade 7, some principals withdrew consent for their school to participate, and thus, these students "dropped out" without having had the opportunity

to remain in the study. The withdrawal of principal or superintendent permission to continue testing resulted in the loss of 561 participants in Grade 6. However, attrition from Grade 5 to Grade 6 among students asked to remain in the study was only 10%. Of the 1,954 participants tested in Grade 6, 21.5% individually withdrew their participation from Grade 7, whereas 337 (17.5%) dropped out because of school/site attrition. In subsequent grades, many of the same schools did not allow us to conduct on-site data collection. We contacted youth in these schools through mail or phone and asked them to complete the survey and mail it back to us or to go online to complete it. Since we consistently contacted all youth who ever participated in the study, many youth not surveyed in earlier grades came back into the study in later waves. During Grades 8 through 12 we continued to contact all youth who participated in the first three waves and, in addition, we increased the sample by expanding our recruitment of youth in 4-H clubs around the country.

Despite our attempts to minimize attrition, a substantial number of participants dropped out of the study at each grade. Participant dropout was not fully random, and as Table 1 shows, our sample became increasingly female and Caucasian over time. Attrition analyses confirmed this general interpretation, with logistic regressions indicating that female and Caucasian participants were significantly less likely to drop out of the study in several waves (see Table 2). We address the issue of missing data recovery in our Analyses section below.

**Measures**

We measured intentional self-regulation with a short version of the SOC questionnaire . Freund, Baltes, and colleagues developed this measure in German but published an English version of the items (Freund & Baltes, 2002), and we administered a slightly modified version of this English version (see Gestsdottir & Lerner, 2007, and the Appendix). In Grades 5 – 9

participants completed six items each for the Selection, Optimization, and Compensation subscales, for a total of 18 items. In Grades 10-12 students additionally completed six items from the Loss-Based Selection (LBS) subscale, resulting in a total of 24 items. The items include two statements, one representing the use of SOC strategies, the other non-SOC related behaviors. For all items, participants decide which of "two people" they were "most like," making all items dichotomously-scaled. The Appendix presents a list of all items.

Because our analyses specifically allowed the structure of SOC to vary over time we could not compute measures of reliability for the separate Selection, Optimization, Compensation, and Loss-Based Selection measures using the present data. Previous research using these data has found consistently low reliabilities for these scales, both in early adolescence (i.e., αs ranging from .10 to .30 at Grade 5; Gestsdottir & Lerner, 2007) and later adolescence (i.e., αs ranging from .23 to .41 at Grade 10; Gestsdottir et al., 2010), mirroring the work of other researchers who have analyzed data from American adults (e.g., αs ranging from .25 to .66 in a sample of middle-aged adults; Bajor & Baltes, 2003). Although these prior findings have justified their use of the SOC scales by pointing to the relative merits of predictive validity (which the SOC scales tend to show) versus internal consistency, the surprisingly low reliability estimates found in prior work further justify our use of EFA in the present study. As an inductive technique, EFA allowed us to find item groupings that displayed high internal consistency rather than relying on item groupings that assumed internal consistency *a priori*.

**Procedure**

Teachers or program staff gave each participant an envelope to take home to his or her parent or guardian. The envelope contained a letter explaining the study, two consent forms (one that parents/guardians returned to the study administrators and one for the parents' or guardians'

personal records), a parent questionnaire, and a self-addressed stamped manila envelope for returning the parent questionnaire and consent form. Trained study staff or hired assistants collected data from individual participants and followed a detailed protocol to ensure uniform study administration and the return of all study materials. The procedure began with reading the instructions for the student questionnaire to the youth. The staff and assistants conducting each data session informed participants that they could skip any questions they did not wish to answer. Data collection occurred during a two-hour block of time which included one or two short rest periods. In Grades 6 and 7, students who could not complete the questionnaires at their school or 4-H site because they missed school during the day of testing or the school superintendent did not allow testing to occur in the school, received a survey in the mail.

In Grades 8 through 12 we surveyed youth in their schools or youth programs following the same procedure as in the first three waves. We contacted youth who were absent on the day of the survey or were from schools that did not allow on-site testing by e-mail, mail, or phone, and asked them to complete and return the survey. Beginning in Grade 9 youth could go online to complete the survey. Youth tested at 4-H clubs were either tested with the paper survey or used club computers to complete the survey online.

**Analyses**

Given its binary nature, we examined the SOC questionnaire in each wave of the 4-H Study data set using categorical exploratory factor analysis (EFA). We analyzed separate tetrachoric correlation matrices for each wave of the 4-H Study using robust weighted-least squares in Mplus (Version 6.11). Tetrachoric correlations estimate the continuous joint distribution underlying binary data and are more appropriate for factor analysis than analyzing

the correlations directly obtained from observed binary data (Rhemtulla, Brosseau-Liard, & Savalei, 2012).

Data from the first five waves of the study (Grades 5 through 9) consisted of an 18-item version of the SOC Questionnaire that only measured the constructs of Elective Selection, Optimization, and Compensation (six items each). Given the increased importance of Loss-Based Selection during later adolescence (Gestsdottir et al., 2010), data from the final three waves (i.e., Grades 10 through 12) also contained six items representing loss-based selection.

We examined two-, three-, and four-factor solutions in each wave and selected final models for each wave using a combination of model fit and the interpretability of the factor structure. Factor loadings came from geomin-rotated (oblique) solutions and we gauged model fit using standard goodness of fit criteria (i.e., RMSEA < .08, CFI and TLI > .90).

Robust weighted least squares will produce unbiased parameter estimates and standard errors when data are missing completely at random after controlling for covariates, a more restrictive assumption than the assumption that data are Missing at Random (MAR) once accounting for correlates of missing data that are included in the model (Asparouhov & Muthén, 2010). Because we did not include covariates in our models, we tested this assumption with Little's (1988) test of MCAR using syntax provided by Enders (2012). We performed separate tests for each wave of data, with the MCAR assumption supported in five waves of data. Our analyses failed to support the MCAR assumption for Grades 8, 10, and 12, but *p*-values for these waves did not fall below .01. Because the MCAR tests did not fail in a consistent pattern across waves, and because this paper aims to explore the development of SOC across waves, we interpreted these results as sufficiently supporting the MCAR assumption to proceed with our analyses.

## Results

An initial set of analyses produced an inconsistent number of factors across grades, largely because items 14 and 17 (which both entailed modeling others) created a factor in some but not all waves. We interpreted this inconsistency as suggesting a weak residual covariance (i.e., shared item variance due to the items having similar wordings) and re-analyzed data from each grade with item 14 removed. A three-factor solution displayed good fit in all subsequent models (see Table 3), with similar factor structures emerging in each grade (see Tables 4 through 7). The two-factor solutions did not display good fit (defined as RMSEAs < .08, CFIs > .90, and TLIs > .90) in any grade, and because of the parsimony of the three-factor models we did not retain any four-factor model in our analyses.

Our first factor represented *Selection*, as a majority of the indicators loading onto it came from the Selection or LBS subscales of the SOC questionnaire. Item 7, an Optimization item, also indicated the Selection factor, but this item asks participants about planning ahead. Instead of interpreting this item in terms of goal pursuit, the recurring relation between Item 7 and Selection suggests that participants may have interpreted this item as indicating pre-optimization goal planning. The only Selection item that did not indicate the Selection factor was Item 13, which asks participants about persistence after they have decided upon a goal. The lack of relation between Item 13 and Selection suggests that participants may have interpreted this item as indicating post-selection actions, that is, as Optimization or Compensation.

The second factor represented general *Intentional Self-Regulation* (ISR), with many of the items indicating ISR mirroring the nine-item composite discussed by Gestsdottir and Lerner (2007). The emergence of this factor reflects the generally high reliability estimates found for the 9-item composite in prior research and supports further use of this composite. Items indicating

ISR came from all subscales of the SOC questionnaire, with LBS items only included in the last three waves of data collection (Grades 10 through 12), displaying especially strong loadings in the later grades (Selection: Two items; Optimization: Three items; Compensation: Three items; Loss-Based Selection: Four items).

Indicators of the third and final factor did not consistently share overlapping item content. Instead, six of the seven reverse-coded items from the SOC questionnaire positively indicated this factor, suggesting it represents a *Reverse-Code Method Factor*, a common phenomenon in scale creation and validation (see Marsh, 1986 and Woods, 2006 for discussions). Researchers generally treat such factors as data artifacts without a meaningful interpretation, although the consistent appearance of this method factor in our models suggests a degree of systematic variation in the way our participants responded to reverse-coded items. The existence of these method factors mirrors other analyses that have considered different variables from this same study (e.g., Geldhof et al., in press), and additional research should determine whether or not this construct can be meaningfully used in future analyses.

Given that the above results strongly suggest a lack of differentiation across adolescence and thus contradict existing theories concerning the development of SOC, we decided to run an additional *post-hoc* confirmatory factor analysis (CFA) using our Grade 12 data. This CFA used robust weighted least squares and specified the expected four-factor structure of Selection, Optimization, Compensation, and Loss-Based Selection. The CFA displayed very poor fit ($\chi^2$ (246) = 1230.69, $p < .001$, RMSEA = .08, C.I. 90% [.07, .08], CFI = .65, TLI = .60), and the modification indices did not suggest any minor changes that could improve fit. Removing the potentially troublesome loss-based selection items did not improve fit ($\chi^2$ (132) = 683.29, $p <$ .001, RMSEA = .08, C.I. 90% [.07, .08], CFI = .61, TLI = .55), suggesting that the structure

found in our EFA models explains the item covariances better than the tripartite structure of SOC that prior work has hypothesized to exist by the end of adolescence.

## Discussion

Intentional self-regulation (ISR) likely undergoes significant development during the second decade of life (Freund & Baltes, 2002; Gestsdottir & Lerner, 2008). Yet, our understanding of ISR development during this period remains incomplete. In the present study we examined one measure of self-regulation, the SOC Questionnaire (Freund & Baltes, 2002), and examined the differentiation of self-regulatory Selection, Optimization, and Compensation behaviors across eight years of adolescence.

Prior theoretically predicated research suggests that the SOC processes should develop and differentiate across adolescence into the constructs described by Baltes and colleagues (see Lerner et al., 2001), and this theory has received some empirical support (Gestsdottir et al., 2009). However, empirical research has been "unable to provide [conclusive] evidence against or in support of… differentiation," (Gestsdottir et al., 2009, p. 591), and other research has modeled the SOC processes using a nine-item subset of the SOC questionnaire (Bowers et al., 2011). Gestsdottir and Lerner (2007) derived this subset as a measure of general (undifferentiated) SOC during early adolescence, although the 9-item composite has displayed adequate reliability in both middle and late adolescence (Bowers et al., 2011). The present study reinforces the utility of the nine-item composite, as the items included in that composite closely mirror the items that consistently indicated our ISR factor. However, our findings, unlike previous studies, suggest a differentiation between two processes, general ISR and elective selection. Due to the consistency of our findings across grades, and the failure of our *post-hoc* CFA, we suggest that future

research on adolescent ISR should replace the nine-item SOC composite with the ISR and Selection factors highlighted in Tables 4 and 5.

The present study provides evidence that the factor structure of the SOC questionnaire is qualitatively different in American adolescents than the structure proposed and examined in a sample of German adults by Freund and Baltes (2002). While the identification of a consistent Selection factor in the present study suggests that American youth generally differentiate Selection from Optimization and Compensation, we found no differentiation between Optimization, Compensation, or Loss-Based Selection. This lack of differentiation may indicate that adolescents perceive developmental losses and the strategy failures that lead to compensatory actions differently than suggested in Baltes and colleagues' original theory, which focused primarily on positive development in aging populations. As individuals get older, Compensation becomes a stronger motivational factor for action (Ebner, Freund, & Baltes, 2006; Freund, 2006); opportunities, as well as physical, cognitive, and temporal resources, become more limited. In contrast, adolescents are more likely to have many opportunities and resources available with fewer proximal deadlines (Heckhausen, Wrosch, & Schulz, 2010). Therefore, they may see both Optimization and Compensation as general goal-directed strategies regardless of the motivation for employing the strategies.

Our identification of a clear Selection factor mirrors the Selection factor proposed by Baltes and colleagues. High levels of Selection in the present study represented a degree of future-oriented planning and a commitment to a set of distal goals. The differentiation of Selection from items representing goal pursuit (e.g., from the Optimization and Compensation scales) also suggests that committing to a clear set of goals is not sufficient for goal attainment in adolescence. This finding supports previous work that has suggested the pattern of relations

between selection and positive development may be nonlinear in adolescence. For instance one study (Napolitano, Bowers, Gestsdottir, Depping et al., 2011) identified two pathways to positive development; one involving consistently low, and the other involving consistently high, use of Selection behaviors. The authors explained that this finding may reflect the developmental uniqueness of adolescence, when having multiple goals or an unclear hierarchy of goals may indicate developmentally appropriate self-exploration. This finding, together with our identification of the Selection factor as distinct from other SOC behaviors, suggests that Selection should be used in adolescence as a separate construct from other SOC behaviors. Therefore, the Selection subscale we identified can be useful to test directly whether there are developmental differences in the relations between selection behaviors and developmental outcomes across adolescence and adulthood.

The second important factor identified in our analyses represented general Intentional Self-Regulation, blurring the line between proactive (Optimization) and reactive (Compensation, Loss-Based Selection) self-regulatory actions hypothesized by the SOC model. As such, we interpret our ISR construct as representing participants' ability to govern interactions with their contexts in ways that produce desired outcomes. Our ISR construct thus represents general adaptive relations between individuals and their contexts, while glossing over the idiographic nature of individual self-regulated actions. Findings of previous studies indicate that the 9-item SOC factor, that closely resembles our ISR factor, has good construct validity. These findings give us confidence that the ISR factor does capture successful self-regulatory strategies in adolescence.

Our final factor appears to indicate a reverse-code method factor, but we must consider what, exactly, this factor represents and what steps future research should take in order to

account for this apparent method effect. Because reverse-coded items in the SOC questionnaire are those items in which participants read a negatively valenced response option before the positively valenced option, the Reverse-Code Method Factor appears to represent participants' tendency to respond to negatively valenced response options. For instance, Item 11 is the only reverse-coded item that did not load onto the reverse-code method factor and posed working on several goals at once as an instantiation of low SOC. This item may not have consistently represented the Reverse-Code Method Factor because participants did not interpret the first response option (i.e., leftmost) that they read as negatively valenced. A similar rationale might also explain why several non-reverse-coded items also displayed consistent negative loadings onto the Reverse-Code Method Factor. Items 1 and 16 loaded negatively onto this factor, with the first (i.e., leftmost) response options reflecting not being able to multitask and asking others for help instead of accepting personal shortcomings, respectively. Similarly, two LBS items (Items 20 and 21) positively indicated this factor, with these items' first response options emphasizing pursuing only essential goals, which youth may interpret as giving up. Participants may have viewed the first response options for these items as negative, thus causing relations between these items and the Reverse-Code Method Factor. Positive relations between the reverse-coded items and the method factor imply that this factor represents a tendency to avoid selecting negatively-valenced items when participants read a negatively valenced response option before the positive option. Similarly, participants may have perceived the first response options for the non-reverse-coded indicators of this factor as negative, whereas we coded these response options as indicative of SOC in the Freund and Baltes (2002) scheme.

In our analyses, the reverse-coded method factor did not consistently correlate with either of the other factors, supporting the idea that it represents a measurement artifact. One should not

expect consistent relations between outcomes and a factor that essentially represents measurement error. The present study only considered items from the SOC questionnaire, however, and future research must replicate this divergent validity (i.e., that the method factor does not correlate with other potentially meaningful constructs, such as emotional regulation) before we can advise dropping the reverse-coded items from consideration. Until further evidence accumulates regarding the reverse-coded method factor, future research must continue to model this method factor in order to establish divergent validity.

Given the importance of ISR for positive developmental outcomes across the life span and the diversity of theories concerning ISR (Geldhof et al., 2010 and McClelland et al., 2010 for reviews), understanding the structure, development, and function of many ISR-related constructs will help researchers better understand the positive development of all people. The SOC model represents one prominent model of ISR, and the present manuscript suggests that studies of adolescent SOC should include measures of both general ISR as well as a goal selection. Much of the existing literature concerning adolescent SOC has focused on general ISR, and including Selection as a separate construct may prove fruitful.

**Limitations and Future Directions**

The study of ISR in adolescence is a relatively recent area of study. As such, there are multiple theoretical and methodological issues that still need to be addressed by future research. The broad importance of self-regulation to positive adolescent development, coupled with the somewhat homogenous nature of the sample obtained in the 4-H Study, suggests that future research should extend our analyses to more diverse samples. Our findings suggest that young adolescents in particular may find it difficult to answer reverse-coded questions or may view multitasking as a more adaptive self-regulation strategy as compared with older adolescents or

adults, but future work must clarify and replicate these findings and determine which factors for which individuals correlate with and predict such unexpected item behavior. Similarly, we only considered the development of ISR using the short form of one specific measure that its creators initially designed to index domain-general skills. Given the heterogeneity of self-regulation as a concept, our results provide only a preliminary glimpse of what is surely the complex development of self-regulation across adolescence.

Our findings therefore suggest the need for a more detailed validation of Selection, Optimization, and Compensation across adolescence, both as conceptual processes and as measured constructs. Previous research using the 4-H data has shown strong relations between the nine-item SOC factor and indices of positive development (e.g., Gestsdottir et al., 2010), but these findings must be replicated and extended. For instance, the 4-H study only included a short form of the larger SOC questionnaire, and we cannot guarantee that future research using alternative measures of SOC will replicate either (a) the criterion relations found in previous research, or (b) the lack of differentiation that we found in the present study. In addition, further validation work should explore the relations between SOC and other manifestations of self-regulation during adolescence, which would provide a richer understanding of adolescents' self-regulated actions.

We did not account for the nested structure of our data, which also limit the generalizability of our findings. Participants were nested within schools and classrooms at each grade, and this nested structure carried across grades. That is, participants were nested in schools and classrooms at Grade 5, were nested in Grade 5 and Grade 6 schools and classrooms at Grade 6, were nested in Grade 5, Grade 6, and Grade 7 schools and classrooms at Grade 7, etc. This structure likely led to as least minor violations of the assumption of independence and warrants

the use of multilevel modeling. However, the complexities of the 4-H Study and its data collection procedures led the researchers to not collect data on participants' school or classroom memberships, making multilevel approaches to these data impossible. Future studies should therefore attend to such issues more carefully in order to differentiate within- and between-group data structures.

Our findings also highlight the field's limited understanding of ISR's development during adolescence and early adulthood. Our findings are based on data that used an abbreviated version of one scale and one relatively homogenous longitudinal sample of American adolescents. Findings from this study have produced most of the literature on adolescent SOC. Indeed, most of the studies cited above used data from this study. Future research should therefore examine the structure and development of ISR using independent samples, and should examine SOC across multiple cultural contexts using a variety of measurement tools (Lerner, Lerner, Lewin-Bizan et al., 2011). We should mention that a multi-cultural study is currently underway, where the authors of the current study compare the factor structure of SOC across four adolescent samples from different countries. Finally, our data were not missing completely at random in some waves of our data, and independent validation would additionally help rule out the possibility that missingness impacted our results in a way that artificially suggests a lack of differentiation.

In addition, changes to the SOC measure, such as replacing the SOC questionnaire's forced-choice response format with a Likert-type format, eliminating reverse-coded items, or focusing on domain-specific versions of SOC, might allow for greater measurement precision and illuminate structural differences that we did not see in the present study. We encourage

future researchers to examine the validity of the two-factor version SOC that we have identified, by examining its predictive relations to indicators of healthy and problematic functioning.

Any future validation work should also consider the potential limitations of asking adolescents and young adults how they typically respond to the loss of previously-available resources. Lerner and colleagues (2001) have argued that adolescents may interpret the losses required for compensation and loss-based selection as actually representing failures, although support for this distinction is sparse. Geldhof and colleagues (2012) found no differentiation between SOC items that specifically tapped resource loss versus failure in a sample of late adolescents, but these findings are specific to a domain-specific measure of SOC and may not generalize to the questionnaire considered in the present study. Future research might therefore consider additional approaches to ensuring the validity of the SOC Questionnaire among American adolescents and young adults, for instance by presenting the results of cognitive interviews in which participants reflect on their own interpretation of the items in the questionnaire.

**Conclusions**

Despite the above limitations, the consistency of our three-factor solution across adolescence has two major implications for our understanding of SOC. First, previous research (e.g., Lerner et al., 2001; Gestsdottir et al., 2010) has suggested that the SOC processes differentiate across adolescence, but empirical research has provided only limited support for this hypothesis. In our analyses we found no evidence of differentiation, suggesting that the differentiation of SOC may occur later in the life course than previously hypothesized. Research that has administered the SOC Questionnaire to American adults has found weak evidence of the SOC Questionnaire's reliability (e.g., Bajor & Baltes, 2003), however, and one might

alternatively hypothesize that SOC as measured by the SOC Questionnaire may not differentiate at all in American samples.

Regardless of how (or if) SOC differentiates in American samples, the second major implication of our study is that the three factors we found both support and extend research on adolescent SOC. The similarity between our ISR factor and the nine-item composite measure of SOC proposed by Gestsdottir and Lerner (2007) provides evidence for latter composite's usefulness and validity. In addition, our consistent identification of a Selection factor supports previous research that suggests the uniqueness of selection behaviors in adolescence (e.g., Napolitano et al., 2011). We therefore suggest that future researchers interested in the relations between SOC and indices of positive development expand their hypotheses to consider Selection and general ISR as potentially complementary processes. Despite the need for further validation work, the ISR and Selection constructs that we identified in this paper provide one mechanism for operationalizing these processes and for helping the field understand agentic behavior across adolescence.

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## Appendix

### Elective Selection

| | |
|---|---|
| Item 01 | I concentrate all my energy on few things. OR<br>I divide my energy among many things. |
| Item 02 | I take things as they come and carry on from there. OR<br>I consider exactly what is important for me. |
| Item 11 | I am always working on several goals at once. OR<br>I always focus on the one most important goal at a given time. |
| Item 12 | Even when I really consider what I want in life, I wait and see what happens instead of committing myself to just one or two particular goals. OR<br>When I think about what I want in life, I commit myself to one or two important goals. |
| Item 13 | When I decide upon a goal, I stick to it. OR<br>I can change a goal again at any time. |
| Item 18 | I always pursue goals one after the other. OR<br>I always pursue many goals at once, so that I easily get bogged down. |

### Optimization

| | |
|---|---|
| Item 03 | When I do not succeed right away at what I want to do, I don't try other possibilities for very long. OR<br>I keep trying as many different possibilities as are necessary to succeed at my goal. |
| Item 06 | When I want to achieve something difficult, I wait for the right moment and the best opportunity. OR<br>When I want to achieve something difficult, I don't want to wait long for the very best opportunity. |
| Item 07 | I don't think long about how to realize my plans, I just try it. OR<br>I think about exactly how I can best realize my plans. |
| Item 08 | I make every effort to achieve a given goal. OR<br>I prefer to wait for a while and see if things will work out by themselves. |
| Item 10 | When I have started something that is important to me, but has little chance at success, I make a particular effort. OR<br>When I start something that is important to me, but has little chance at success, I usually stop trying. |
| Item 14 | When I want to get ahead, I don't have a tendency to look at how others have done it. OR<br>When I want to get ahead, I also look at how others have done it. |

### Compensation

| | |
|---|---|
| Item 04 | When something does not work as well as before, I get advice from experts or read books. OR<br>When something does not work as well as before, I am the one who knows what is best for me. |
| Item 05 | Even if something is important to me, it can happen that I don't invest the necessary time or effort. OR<br>For important things, I pay attention to whether I need to devote more time or |

| | |
|---|---|
| | effort. |
| Item 09 | Even in difficult situations, I don't burden others. OR<br>When things aren't going so well, I accept help from others. |
| Item 15 | When things don't work the way they used to, I look for other ways to achieve them. OR<br>When things don't work the way they used to, I accept things the way they are. |
| Item 16 | When I can't do something as well as I used to, then I ask someone else to do it for me. OR<br>When I can't do something as well as I used to, I accept the change. |
| Item 17 | When something doesn't work as well as usual, I look at how others do it. OR<br>When something doesn't work as well as usual, I don't spend much time thinking about it. |

**Loss-Based Selection**

| | |
|---|---|
| Item 19 | When I can't do something as well as I used to, I think about what exactly is important to me. OR<br>When I can't do something as well as I used to, I wait and see what comes |
| Item 20 | If I can't do something as well as before, I concentrate only on essentials. OR<br>Even if I can't do something as well as before, I pursue all my goals |
| Item 21 | When I can't carry on as I used to, I direct my attention to my most important goal first. OR<br>When I can't carry on as I used to, I direct my attention like usual to all my goals. |
| Item 22 | When things don't work so well, I pursue my most important goal. OR<br>When things don't go so well, I leave it at that. |
| Item 23 | When I am not able to achieve something anymore, I direct my efforts at what is still possible. OR<br>When I am not able to achieve something anymore, I trust that the situation will improve by itself. |
| Item 24 | When I can no longer do something in my usual way, I think about what, exactly, I am able to do under the circumstances. OR<br>When I can no longer do something in my usual way, I don't think long about it. |

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Table 1

Demographic characteristics

| | n | Female % | American Indian % | Asian % | Black % | Latino % | White % | Multiracial % |
|---|---|---|---|---|---|---|---|---|
| Grade 5 | 1693 | 51.8 | 4.1 | 3.6 | 8.4 | 17.7 | 54.0 | 7.2 |
| Grade 6 | 1833 | 57.6 | 3.5 | 2.7 | 7.8 | 15.6 | 61.4 | 4.3 |
| Grade 7 | 1810 | 59.3 | 1.8 | 2.7 | 7.5 | 12.1 | 68.3 | 4.8 |
| Grade 8 | 1471 | 61.3 | 1.7 | 3.6 | 9.4 | 11.8 | 70.8 | 2.7 |
| Grade 9 | 976 | 60.3 | 3.0 | 3.0 | 9.8 | 11.4 | 67.2 | 3.0 |
| Grade 10 | 1858 | 62.8 | 0.9 | 1.7 | 6.0 | 7.4 | 78.9 | 3.3 |
| Grade 11 | 985 | 67.4 | 1.5 | 3.0 | 5.1 | 3.5 | 83.8 | 2.4 |
| Grade 12 | 704 | 68.5 | 1.5 | 4.0 | 4.2 | 6.0 | 81.1 | 2.9 |

Table 2

*Odds Ratios for Gender and Ethnicity Predicting Attrition Between Grade Indicated and Prior Grade*

| Grade | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|
| Female | 0.78** | 0.88 | 0.92 | 0.95 | 0.82 | 0.71** | 0.91 |
| Caucasian | 0.71*** | 0.80* | 0.87 | 1.47*** | 0.92 | 0.70** | 1.18 |

* $p < .05$ ** $p < .01$ ***$p < .001$

Table 3

*Model Fit for a three-Factor Solution based on Exploratory Factor Analyses*

| | $\chi^2$ | *df* | *p* | RMSEA [90% CI] | CFI | TLI |
|---|---|---|---|---|---|---|
| Grade 5 | 176.58 | 88 | < .001 | .02 [.02, .03] | .94 | .91 |
| Grade 6 | 216.33 | 88 | < .001 | .03 [.02, .03] | .95 | .92 |
| Grade 7 | 251.58 | 88 | < .001 | .03 [.03, .04] | .94 | .91 |
| Grade 8 | 178.56 | 88 | < .001 | .03 [.02, .03] | .96 | .93 |
| Grade 9 | 186.50 | 88 | < .001 | .03 [.03, .04] | .94 | .91 |
| Grade 10* | 501.78 | 187 | < .001 | .03 [.03, .03] | .95 | .93 |
| Grade 11* | 443.18 | 187 | < .001 | .04 [.03, .04] | .93 | .90 |
| Grade 12* | 333.34 | 187 | < .001 | .03 [.03, .04] | .95 | .93 |

*The addition of Loss-Based Selection items in these waves resulted in increased $\chi^2$ and *df* values

Table 4

*Factor Loadings for Selection*

| | | | Grade | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Construct | Item | Positive Item Stem | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Selection | **Item 1** | Concentrate on few things | 0.45 | 0.29 | 0.29 | . | 0.42 | . | 0.36 | 0.40 |
| Selection | **Item 2** | Consider what is important | . | . | 0.30 | 0.52 | . | 0.37 | . | 0.38 |
| Optimization | Item 3 | Keep trying different possibilities | . | . | . | . | -0.25 | . | . | . |
| Compensation | Item 4 | Get advice or read books | . | . | . | . | . | . | . | . |
| Compensation | Item 5 | Devote more time or effort | . | . | . | 0.41 | . | 0.25 | 0.27 | . |
| Optimization | Item 6 | Wait for the right moment | . | . | . | . | . | . | . | . |
| Optimization | **Item 7** | Think about my plans | . | . | 0.32 | 0.61 | . | 0.31 | 0.30 | 0.38 |
| Optimization | Item 8 | I make every effort | . | . | . | . | . | . | . | . |
| Compensation | Item 9 | I accept help from others | . | . | . | . | . | . | . | . |
| Optimization | Item 10 | I make particular effort | . | . | . | . | . | . | . | . |
| Selection | **Item 11** | Always focus on one goal | 0.46 | 0.68 | 0.67 | 0.42 | 0.65 | 0.62 | 0.88 | 0.67 |
| Selection | **Item 12** | Commit to one or two goals | . | . | 0.40 | 0.57 | . | 0.46 | 0.47 | 0.42 |
| Selection | Item 13 | Stick to goal | . | . | 0.25 | 0.28 | . | . | . | . |
| Compensation | Item 15 | Look for other ways to achieve | . | . | . | . | -0.29 | . | . | . |
| Compensation | Item 16 | Ask someone else to do it | . | . | . | -0.29 | . | . | . | . |
| Compensation | Item 17 | Look at how others do it | . | . | . | . | . | . | . | . |
| Selection | **Item 18** | Pursue goals one after another | 0.26 | 0.29 | 0.34 | 0.26 | 0.41 | 0.37 | 0.39 | . |
| LBS | Item 19 | Think about what is important | *NA* | *NA* | *NA* | *NA* | *NA* | . | . | 0.28 |
| LBS | Item 20 | Concentrate on essentials | *NA* | *NA* | *NA* | *NA* | *NA* | . | . | . |
| LBS | **Item 21** | Attention to most important goal | *NA* | *NA* | *NA* | *NA* | *NA* | 0.30 | . | 0.32 |
| LBS | Item 22 | Pursue most important goal | *NA* | *NA* | *NA* | *NA* | *NA* | . | . | . |
| LBS | Item 23 | Direct efforts to what is possible | *NA* | *NA* | *NA* | *NA* | *NA* | . | . | . |
| LBS | Item 24 | Think about what I can do | *NA* | *NA* | *NA* | *NA* | *NA* | . | . | . |

Note: Loadings < .25 omitted
**Bold and Underlined** items consistently load onto this construct

Table 5

*Factor Loadings for Intentional Self-Regulation*

| | | | Grade | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Construct | Item | Positive Item Stem | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Selection | Item 1 | Concentrate on few things | . | . | . | 0.29 | . | . | . | . |
| Selection | Item 2 | Consider what is important | . | . | . | . | . | . | . | . |
| Optimization† | Item 3 | Keep trying different possibilities | 0.61 | . | . | . | . | . | 0.28 | . |
| Compensation | **Item 4** | Get advice or read books | . | 0.28 | 0.35 | 0.34 | 0.49 | 0.34 | 0.39 | 0.41 |
| Compensation† | Item 5 | Devote more time or effort | 0.49 | . | . | . | . | . | . | . |
| Optimization | **Item 6** | Wait for the right moment | . | 0.31 | 0.31 | 0.33 | 0.37 | 0.39 | 0.44 | 0.45 |
| Optimization† | Item 7 | Think about my plans | 0.33 | . | . | . | . | . | . | . |
| Optimization† | **Item 8** | I make every effort | 0.51 | 0.61 | 0.66 | 0.54 | 0.56 | 0.65 | 0.64 | 0.66 |
| Compensation | Item 9 | I accept help from others | . | . | . | . | . | . | . | . |
| Optimization† | **Item 10** | I make particular effort | 0.69 | 0.69 | 0.72 | 0.59 | 0.50 | 0.66 | 0.73 | 0.74 |
| Selection | Item 11 | Always focus on one goal | . | . | -0.26 | . | . | -0.31 | -0.50 | -0.49 |
| Selection | Item 12 | Commit to one or two goals | . | . | . | . | . | . | . | . |
| Selection† | **Item 13** | Stick to goal | 0.61 | 0.48 | 0.45 | 0.52 | 0.37 | 0.49 | 0.54 | 0.45 |
| Compensation† | **Item 15** | Look for other ways to achieve | 0.39 | 0.54 | 0.44 | 0.50 | 0.53 | 0.66 | 0.70 | 0.71 |
| Compensation | Item 16 | Ask someone else to do it | -0.39 | . | . | . | . | . | . | . |
| Compensation† | **Item 17** | Look at how others do it | 0.37 | 0.45 | 0.50 | 0.41 | 0.51 | 0.65 | 0.65 | 0.71 |
| Selection† | **Item 18** | Pursue goals one after another | 0.35 | 0.52 | 0.46 | 0.51 | 0.62 | 0.42 | 0.38 | 0.44 |
| LBS | **Item 19** | Think about what is important | *NA* | *NA* | *NA* | *NA* | *NA* | 0.39 | 0.48 | 0.45 |
| LBS | Item 20 | Concentrate on essentials | *NA* | *NA* | *NA* | *NA* | *NA* | . | . | . |
| LBS | **Item 21** | Attention to most important goal | *NA* | *NA* | *NA* | *NA* | *NA* | . | 0.27 | 0.28 |
| LBS | **Item 22** | Pursue most important goal | *NA* | *NA* | *NA* | *NA* | *NA* | 0.76 | 0.77 | 0.72 |
| LBS | **Item 23** | Direct efforts to what is possible | *NA* | *NA* | *NA* | *NA* | *NA* | 0.54 | 0.59 | 0.64 |
| LBS | **Item 24** | Think about what I can do | *NA* | *NA* | *NA* | *NA* | *NA* | 0.74 | 0.76 | 0.79 |

Note: Loadings < .25 omitted

† Items represent Gestsdottir and Lerner's (2007) 9-item scale, which did not consider LBS.

**Bold and Underlined** items consistently load onto this construct

Table 6

*Factor Loadings for Reverse-Code Method Factor*

| | | | Grade | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Construct | Item | Positive Item Stem | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Selection | **Item 1** | Concentrate on few things | . | -0.48 | -0.55 | -0.69 | -0.43 | -0.50 | -0.47 | -0.50 |
| Selection‡ | **Item 2** | Consider what is important | 0.34 | 0.34 | 0.30 | . | 0.45 | 0.33 | . | 0.32 |
| Optimization‡ | **Item 3** | Keep trying different possibilities | . | 0.66 | 0.74 | 0.67 | 0.73 | 0.72 | 0.71 | 0.77 |
| Compensation | Item 4 | Get advice or read books | . | . | . | . | . | . | -0.27 | -0.25 |
| Compensation‡ | **Item 5** | Devote more time or effort | . | 0.58 | 0.61 | 0.30 | 0.64 | 0.54 | 0.53 | 0.58 |
| Optimization | Item 6 | Wait for the right moment | . | . | . | . | . | . | . | . |
| Optimization‡ | **Item 7** | Think about my plans | 0.45 | 0.54 | 0.40 | . | 0.56 | 0.39 | 0.38 | 0.42 |
| Optimization | Item 8 | I make every effort | . | . | . | . | . | . | . | . |
| Compensation‡ | **Item 9** | I accept help from others | . | 0.34 | 0.49 | 0.29 | 0.34 | 0.34 | 0.28 | 0.27 |
| Optimization | Item 10 | I make particular effort | . | . | . | . | . | . | . | . |
| Selection‡ | Item 11 | Always focus on one goal | 0.51 | . | . | -0.43 | . | . | . | . |
| Selection‡ | **Item 12** | Commit to one or two goals | 0.31 | 0.35 | 0.25 | . | 0.49 | 0.36 | 0.36 | 0.37 |
| Selection | Item 13 | Stick to goal | . | . | . | . | 0.32 | . | . | . |
| Compensation | Item 15 | Look for other ways to achieve | -0.34 | . | . | . | . | . | . | . |
| Compensation | **Item 16** | Ask someone else to do it | . | -0.45 | -0.45 | . | -0.37 | -0.47 | -0.48 | -0.41 |
| Compensation | Item 17 | Look at how others do it | -0.27 | . | . | . | . | . | . | . |
| Selection | Item 18 | Pursue goals one after another | . | . | . | -0.25 | . | . | . | . |
| LBS | Item 19 | Think about what is important | *NA* | *NA* | *NA* | *NA* | *NA* | . | . | . |
| LBS | **Item 20** | Concentrate on essentials | *NA* | *NA* | *NA* | *NA* | *NA* | -0.75 | -0.72 | -0.76 |
| LBS | **Item 21** | Attention to most important goal | *NA* | *NA* | *NA* | *NA* | *NA* | -0.44 | -0.45 | -0.41 |
| LBS | Item 22 | Pursue most important goal | *NA* | *NA* | *NA* | *NA* | *NA* | . | . | . |
| LBS | Item 23 | Direct efforts to what is possible | *NA* | *NA* | *NA* | *NA* | *NA* | . | . | . |
| LBS | Item 24 | Think about what I can do | *NA* | *NA* | *NA* | *NA* | *NA* | . | . | . |

Note: Loadings < .25 omitted
‡ items are reverse-coded.
**Bold and Underlined** items that load onto this construct

Table 7

*Factor Correlations*

| Grade | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|
| ISR with | | | | | | | | |
| Selection | -.06 | .16 | .15 | .17 | -.19 | .12 | .30*** | .14 |
| Reverse-Code | .12 | .19* | .14 | .43*** | .39 | .22*** | .15 | .17 |
| Selection with | | | | | | | | |
| Reverse-Code | -.22 | .25** | .24** | .29*** | .03 | -.04 | -.01 | -.10 |

* $p < .05$ ** $p < .01$ *** $p < .001$